

**Abortion is the expulsion or extraction of an embryo or fetus weighing 500 g or less from its mother when it is not capable of independent survival (i.e. before the period of viability)**

## Incidence

- 10–20% of all clinical pregnancies
- 75% abortions occur before the 16th week
- Rates vary with maternal age; also high in women with past miscarriages

# Abortion

## Spontaneous

## Induced

Isolated

Recurrent

MTP

Illegal

Threatened

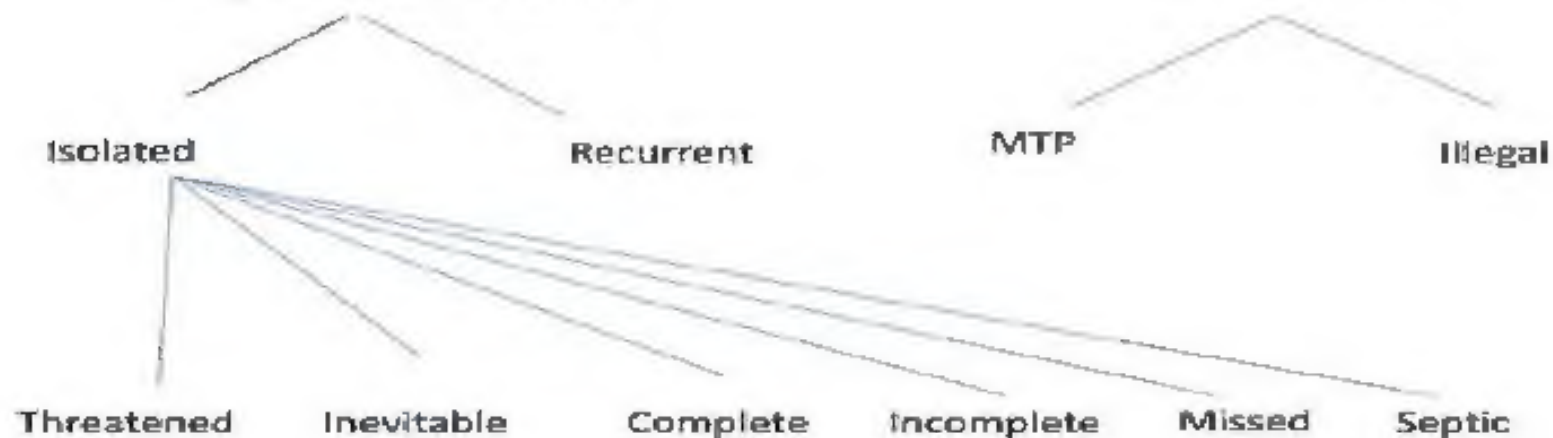
Inevitable

Complete

Incomplete

Missed

Septic



# Etiology

- Fetal Factors
- Maternal Factors

## Fetal Factors

- Genetic
  - 50% of early miscarriage is due to chromosomal abnormalities
  - Numerical defects like Trisomy, Polyploidy, Monosomy
  - Structural defects like translocation, deletion, inversion
- Multiple Pregnancies
- Degeneration of villi

# Maternal Factors

- **ENDOCRINE AND METABOLIC FACTORS (10–15%):**
  - **Luteal Phase Defect**
  - **Thyroid abnormalities**
  - **Diabetes mellitus**
- **Anatomical abnormalities (10–15%)**  
**Cervicouterine factors**
  - Cervical incompetence & insufficiency
  - Congenital malformation of the uterus
  - Uterine Fibroid
  - Intrauterine adhesions

- Infections (5%)
  - Viral: rubella, cytomegalo, HIV,...
  - Parasitic: toxoplasma, malaria,...
  - Bacterial: ureaplasma, chlamydia,...
- IMMUNOLOGICAL DISORDERS (5–10%)—
  - • *Autoimmune disease*
  - • *Alloimmune disease*
  - • *Antifetal antibodies*

- **Environmental Factors**
  - Cigarette smoking
  - Alcohol consumption
  - Contraceptive agents
- **Maternal medical illness**
  - Cyanotic heart disease
  - Hemoglobinopathies
- **Unexplained (40-60%)** – In majority, the exact cause is not known.



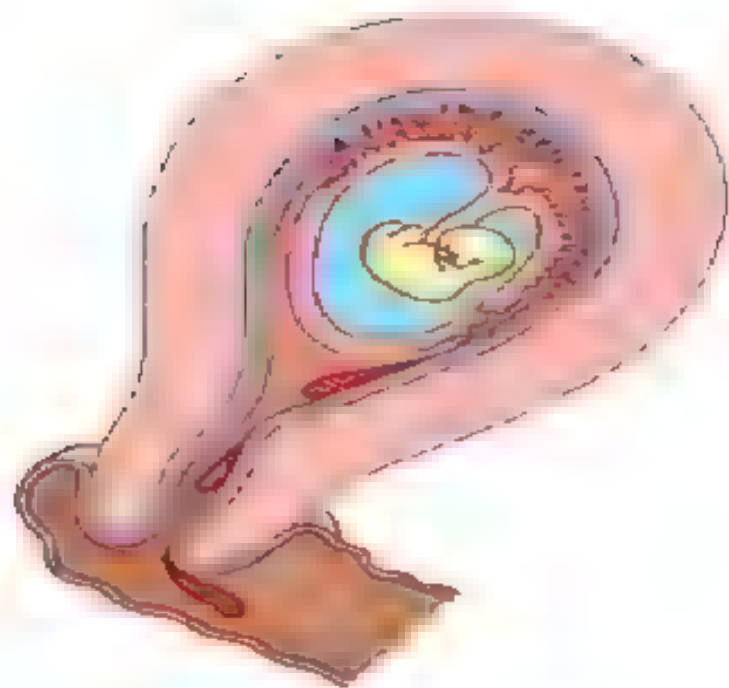
## Threatened Abortion

- Condition in which miscarriage has started but has not progressed to a state from which recovery is impossible

## CLINICAL FEATURES:

- The patient, having amenorrhea, complains of:
  - (1) Slight *bleeding per vaginam*
  - (2) *Pain: Usually painless; there may be mild backache or dull pain in lower abdomen*

- The uterus and cervix feel soft.
- Digital examination reveals closed external os
- Differential diagnosis includes
  - cervical ectopy
  - polyps or carcinoma
  - ectopic pregnancy
  - molar pregnancy
- Ultrasound is diagnostic; Pelvic examination is avoided when USG is available



**Threatened miscarriage**

## Management & Prognosis

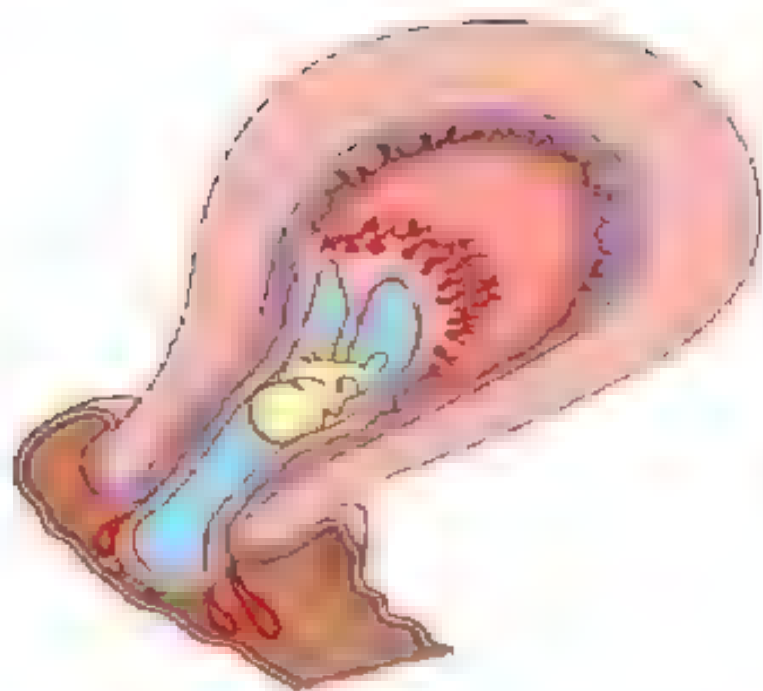
- Rest: Patient should be in bed for few days until bleeding stops
- Relief of pain: Diazepam 5 mg BD
- 80% of pregnancies with threatened abortions go on until term
- If a live fetus is seen on USG, pregnancy is likely to continue in over 95% cases.
- If pregnancy continues, there is increased frequency of preterm labor, placenta previa & IUGR

## Inevitable Abortion

It is the clinical type of abortion where the changes have progressed to a state from where continuation of pregnancy is impossible.

## CLINICAL FEATURES:

- The patient, having the features of threatened miscarriage, presents with
  - vaginal bleeding
  - Aggravation of colicky pain in the lower abdomen
- Sometimes, the features may develop quickly without prior clinical evidence of threatened miscarriage
- Internal examination reveals dilated internal os through which the products of conception are felt



**Inevitable miscarriage**



# Management

- Management is aimed:
  - To accelerate the process of expulsion
  - To maintain strict asepsis
- *If pregnancy < 12 weeks, suction evacuation is done*
- *If pregnancy > 12 weeks, expulsion by oxytocin infusion*
- *General measures:*
  - *Excessive bleeding is controlled by administering methergin 0.2 mg*
  - Blood loss is corrected by IV fluid therapy and blood transfusion

## Incomplete abortion

The process of abortion has already taken place, but the entire products of conception are not expelled & a part of it is left inside the uterine cavity

## Clinical features:

- History of expulsion of a fleshy mass per vaginam,
  - Continuation of pain in lower abdomen
  - Persistence of vaginal bleeding
- Internal examination reveals
  - uterus smaller than the period of amenorrhea
  - Open internal os
  - varying amount of bleeding
- On examination, the expelled mass is found incomplete

## Complications:

- The retained products may cause
  - (a) bleeding (b) sepsis or (c) placental polyp



Incomplete miscarriage

## MANAGEMENT:

- Evacuation of the retained products of conception (ERCP)
- Early abortion: Dilatation and evacuation Under analgesia or general anesthesia is to be done.
- Late abortion: Uterus is evacuated under general anesthesia and the products are removed by ovum forceps or by blunt curette. In late cases, D&C is to be done to remove the bits of tissues left behind.
- Prophylactic antibiotics are given. removed materials are subjected to a histological examination.
- Medical management - Tab. Misoprostol 200 µg is used vaginally every 4 hours

## Complete Abortion

- When the products of conception are completely expelled from the uterus, *it is called complete miscarriage.*

## Clinical features

- There 's history of expulsion of a fleshy mass per vaginam followed by
  - Subsidence of abdominal pain
  - Vag'nal bleeding becomes trace or absent
- Internal examination reveals:
  - Uterus smaller than the period of amenorrhea
  - Cervical os is closed
  - Bleeding is trace.
- Transvaginal sonography confirms that uterus is empty

## Missed Abortion

- The fetus is dead and retained passively inside the uterus for a variable period
- It is diagnosed when there is a fetus with a crown rump length of 5mm without a fetal heart.



- **CLINICAL FEATURES:**

The patient usually presents with features of threatened miscarriage followed by:

- Subsidence of pregnancy symptoms
- Uterus becomes smaller in size
- Cervix feels firm with closed internal os
- Nonaudibility of the fetal heart sound even with Doppler ultrasound
- Immunological test for pregnancy becomes negative

## Complications

- Retaining the products for long time can lead to sepsis
- DIC [Disseminated Intravascular Coagulation]
  - (very rare) in gestations exceeding 16 weeks

# Management

*Uterus is less than 12 weeks:*

- Prostaglandin E1 (Misoprostol) 800 mg is given vaginally and repeated after 24 hours if needed. Expulsion usually occurs within 48 hours
- Suction evacuation is done when the medical method fails

*Uterus more than 12 weeks*

- 6<sup>th</sup> or 12<sup>th</sup> hourly misoprostol tablets given vaginally
- If this fails, extraamniotic instillation of ethacridine lactate is used
- Antibiotics are given

## Septic Abortion

- Any abortion associated with clinical evidences of infection of the uterus and its contents
- Most common cause – Attempt at induced abortion by an untrained person without the use of aseptic precautions

## Clinical Grading:

- **Grade—I:** The infection is localized in the uterus.
- **Grade—II:** The infection spreads beyond the uterus to the parametrium, tubes and ovaries or pelvic peritoneum.
- **Grade—III:** Generalized peritonitis and/or endotoxic shock or jaundice or acute renal failure.

Grade-I is the commonest and is usually associated with spontaneous abortion

## Clinical Features

- Fever, abdominal pain and vomiting or diarrhoea
- A rising pulse rate of 100–120/min or more is a significant finding than even pyrexia. It indicates spread of infection beyond the uterus.
- Examination shows abdominal tenderness, guarding, rigidity
- *Internal examination reveals:*
  - *offensive purulent vaginal discharge*
  - *tender uterus usually with patulous os or a boggy feel*
  - Soft cervix with open internal os

## Investigations

- CBC
- Serum urea, creatinine, electrolytes
- High vaginal swab
- Blood culture in suspected septicaemia
- Pelvic USG to detect retained products of conception
- X-ray abdomen in suspected bowel injury
- X-ray chest if there is difficulty in respiration

# Complications

## Immediate:

- Hemorrhage
- *Injury may to uterus & adjacent structures*
- *Spread of infection leads to:*
  - *Generalized peritonitis*
  - Endotoxic shock—mostly due to *E. Coli*
  - *DIC*
  - *Acute renal failure*
  - *Thrombophlebitis.*
- All these lead to increased maternal deaths



# Management

- Mild cases
  - Broad spectrum antibiotics started
  - Uterus is evacuated
- Severe Cases
  - Vigorous IV infusion with crystalloid
  - Oxygen given by nasal catheter
  - Broad spectrum antibiotics – combination of ampicillin, gentamicin, metronidazole is started
  - Uterus is evacuated in 4-6 hrs of commencing therapy.

## Recurrent Miscarriage/ Pregnancy loss

## Recurrent Abortion

- **Recurrent miscarriage is defined as a sequence of three or more consecutive spontaneous abortion**
- Seen in ~ 1% of all women
- Risk increases with each successive abortion
- No underlying cause is found for 50% of recurrent pregnancy loss

# Etiology

## FIRST TRIMESTER ABORTION:

- *Genetic factors (3–5%):*
  - *Parental chromosomal abnormalities*
  - The most common abnormality is a *balanced translocation*.
  - This leads to unbalanced translocation in the fetus, causing early miscarriage or a live birth with congenital malformations
  - Risk of miscarriage in couples with a balanced translocation is > 25%.
  - This is the most common cause for 1<sup>st</sup> trimester loss

- *Endocrine and Metabolic:*
  - *Poorly controlled diabetic patients*
  - *Presence of thyroid autoantibodies*
  - *Luteal phase defect*
  - *Hypersecretion of luteinizing hormone (e.g. in PCOS).*
- *Infection:*
  - *Infection in the genital tract - (Transplacental fetal infection)*
  - *Syphilis*
- *Inherited thrombophilia*
  - *Protein C deficiency, Protein S deficiency, factor V Leiden mutation, prothrombin gene mutation*

- *Immunological cause:*

Autoimmunity – Antiphospholipid antibody syndrome(15%).

- Antiphospholipid antibodies present in mother produce adverse fetal outcome
- Diagnosis by presence of lupus anticoagulant/IgG/IgM anticardiolipin antibodies

Alloimmune factors

- Immune response against paternal antigens in the fetus
- This is a result of lack of production of blocking antibodies by the mother due to failure of recognition of TLX

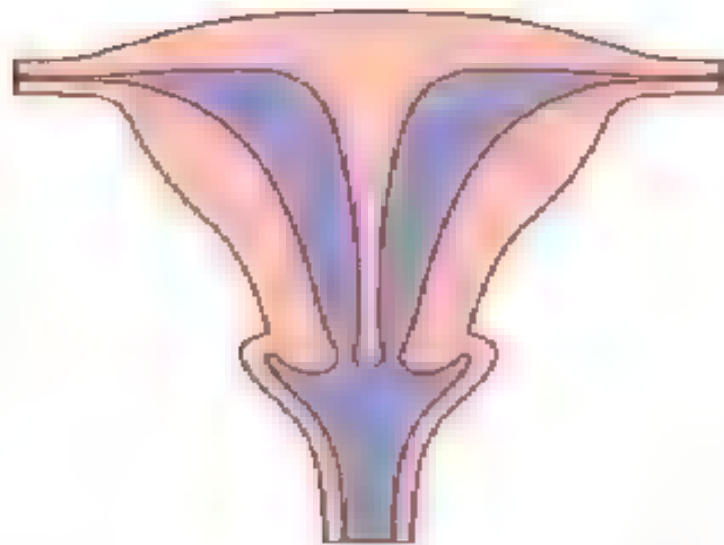
## SECOND TRIMESTER MISCARRIAGE:

- Anatomic abnormalities - responsible for 10–15% of recurrent abortion.
- Causes may be
  - (a) Congenital - defects in the *mullerian duct fusion* (*e.g. unicornuate, bicornuate, septate or double uterus*)
  - (b) Acquired - intrauterine adhesions, uterine fibroids and endometriosis, cervical incompetence

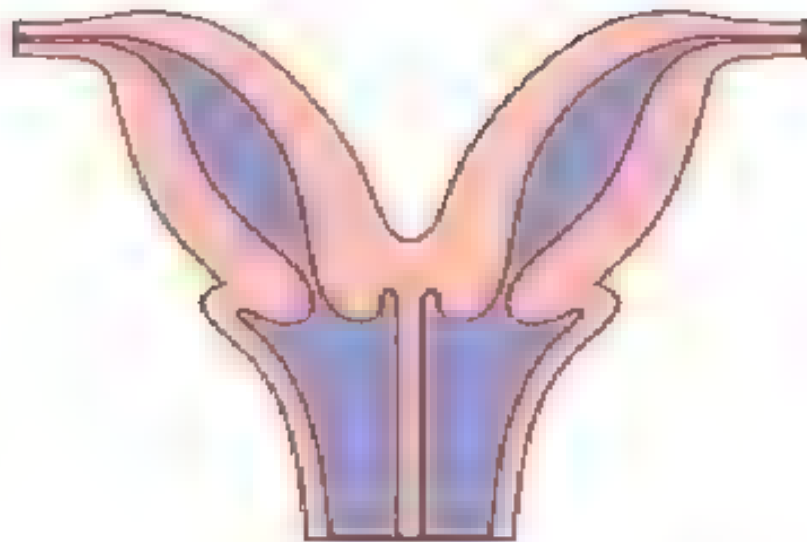
## ***Uterine Causes***

- Defects of mullerian fusion
  - Double uterus, septate or bicornuate uterus
  - About 12% cases of recurrent abortion.
  - Implantation on the septum leads to defective placentation
- Asherman syndrome – Intrauterine adhesions due to previous curettage – can lead to early miscarriage
- Transvaginal ultrasound is used for diagnosis;
- Hysteroscopic resection for septum or division of adhesions in Asherman's syndrome.
- Submucous fibroids - managed by myomectomy

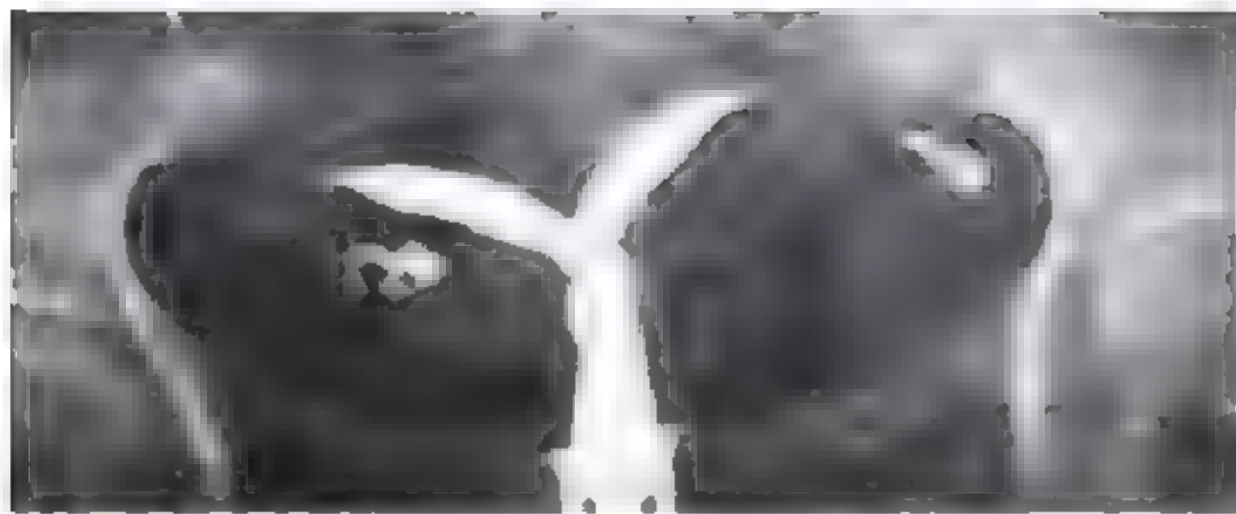




**Septate Uterus**



**Double Uterus**



Hysterosalpingography showing bicornuate uterus

## Cervical Insufficiency (Incompetence)

- Painless cervical dilatation with ballooning of amniotic sac into vagina, followed by rupture of membrane and expulsion of fetus
- Usually at 16 – 24 weeks

## Etiology

- Congenital
  - Developmental weakness of cervix
  - Uterine anomalies
- Acquired (iatrogenic)—common, following:
  - (i) D&C operation
  - (ii) Induced abortion by D and E
  - (iii) vaginal operative delivery through an undilated cervix
  - (iv) amputation of the cervix or cone biopsy.
- Multiple gestations, prior preterm birth.

## Diagnosis

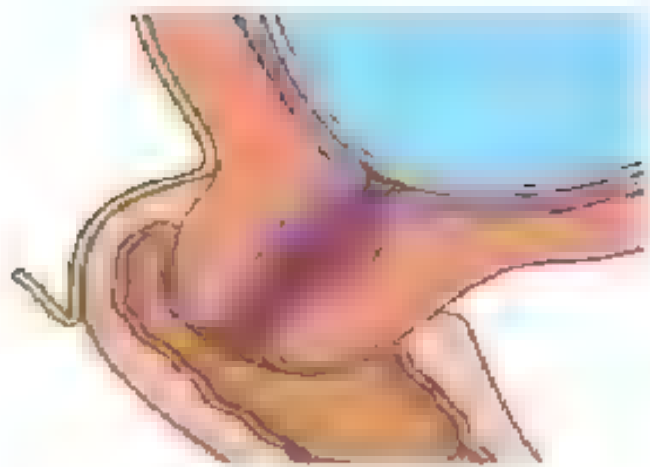
- *History - Repeated mid trimester painless cervical dilatation and escape of liquor amnii followed by painless expulsion of the products of conception*
- Internal examination:
  - Interconceptual period:
    - Passage of no. 6–8 Hegar dilator beyond the internal os without any resistance or pain
    - Funnelling of internal os seen in hysterosalpingography

## During pregnancy

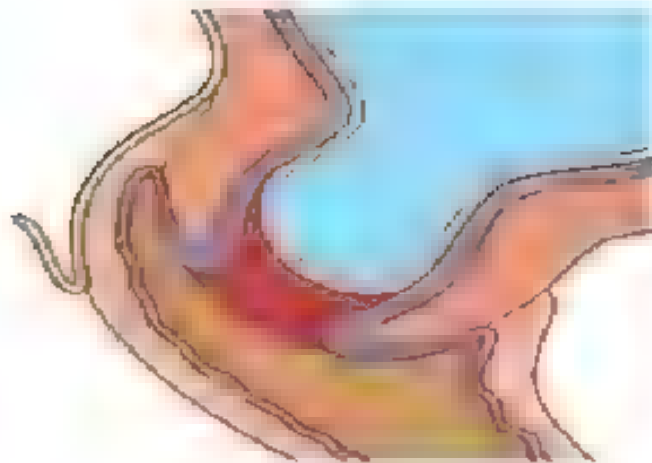
- Clinical digital – Painless cervical shortening and dilatation
- Sonography: Trans vaginal ultrasound is performed. Short cervix  $< 25$  mm; Funnelling of the internal Os  $> 1$  cm.

# Management

- Surgical management – Cervical circlage
- Usually at 12-14 weeks
- The procedure reinforces the weak cervix by a non-absorbable tape, placed around the cervix at the level of internal os.

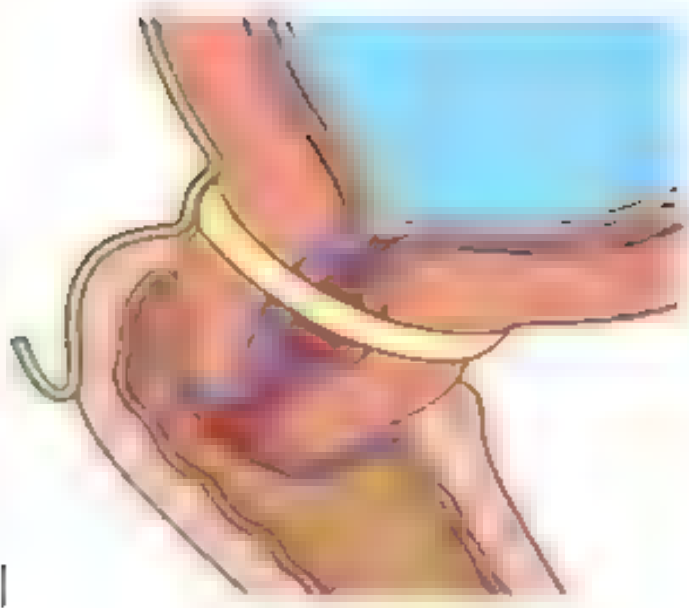


**Normal  
(Competent)  
cervix**



**Incompetent cervix with  
herniation of the membranes**





Competency restored after encirclage operation

- **Contraindications**
  - Intrauterine infection
  - Ruptured membranes
  - History of vaginal bleeding
  - Severe uterine irritability
  - Cervical dilatation > 4 cm.
- 2 main methods – McDonald and Modified Shirodkar
- Success rates - 80 – 90%

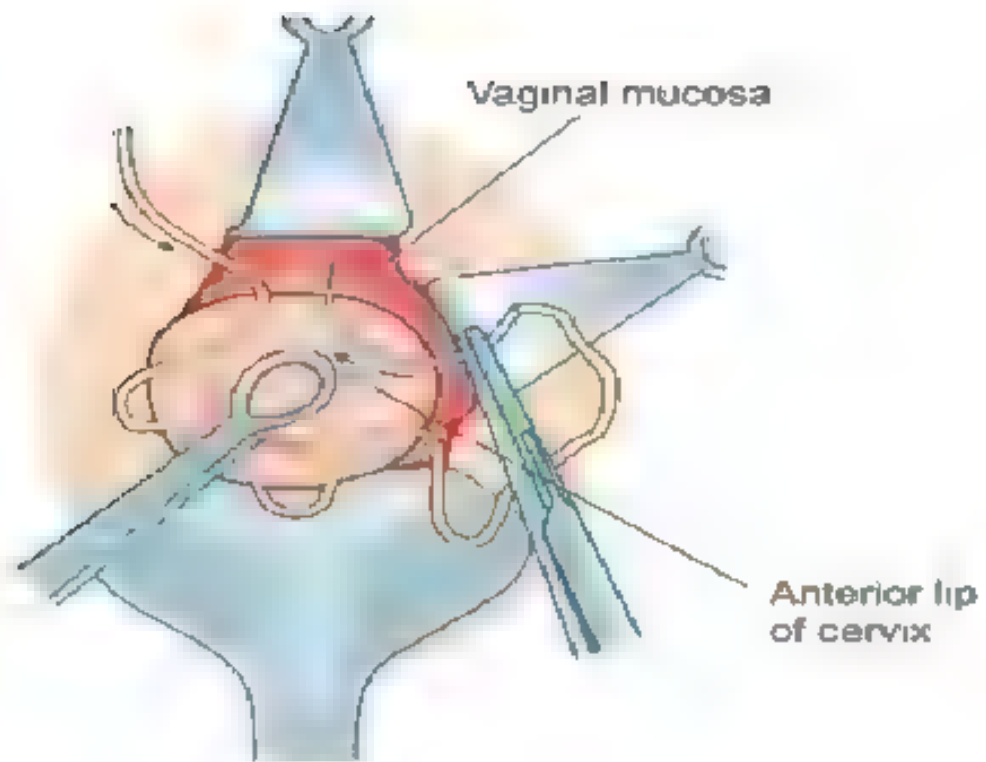
## Types of circlage

- History Indicated
  - Definite history of 3 previous second trimester losses/ preterm births
- Ultrasound indicated
  - Short ended cervix or early funnelling in ultrasound in a woman with 1 or 2 spontaneous losses
- Examination indicated / Rescue circlage
  - Performed after the cervix is found dilated
  - Also called emergency circlage

# Methods

## I. McDONALD'S OPERATION

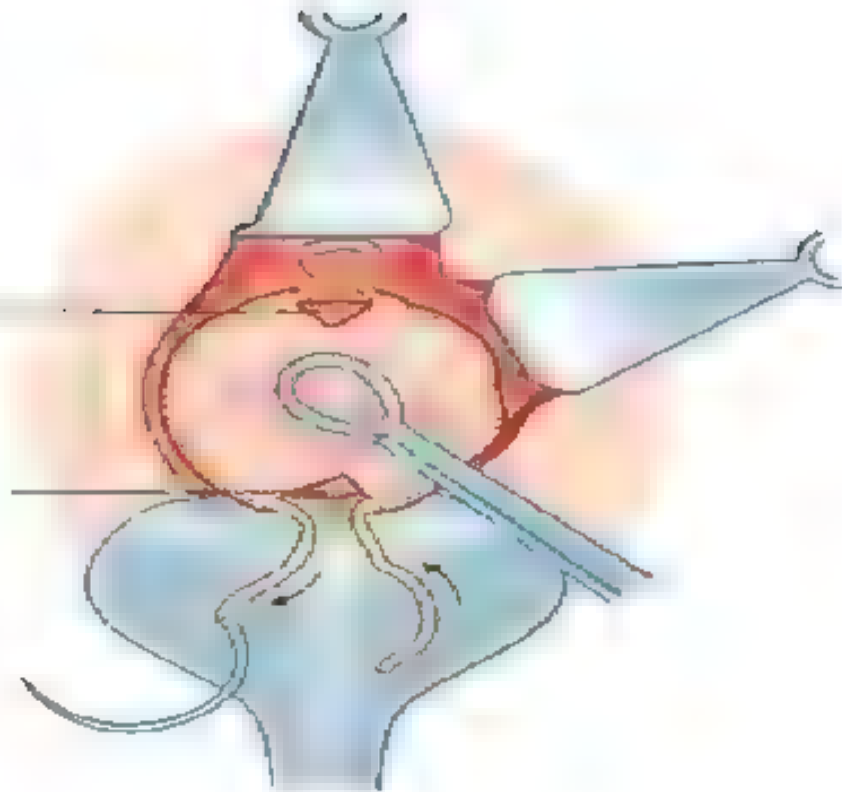
- The non-absorbable suture material (Mersilene) is placed as a purse string suture, as high as possible (level of internal os)
- The suture starts at the anterior wall of the cervix. Taking successive deep bites (4–5 sites) it is carried around the lateral and posterior walls back to the anterior wall again where the two ends of the suture are tied.
- Commonly performed method nowadays.



## II. Modified Shirokdar Circlage

- A transverse incision is made on the vaginal wall and the bladder is pushed up to expose the level of the internal os.
- The non-absorbable suture material—Mersilene tape is passed submucously with the help of any curved round bodied needle so as to bring the suture ends to the posterior.
- The ends of the tapes are tied up posteriorly by a knot.
- The anterior incision is repaired using chromic catgut.

Anterior  
transverse  
incision



### III. Transabdominal Cerclage

- Rarely done in cases of repeated failure of vaginal approach
- Cerclage is placed at the level of isthmus
- Delivery by CS



- *Postoperative care:*
  - *The patient should be in bed for at least 2–3 days*
  - *Progesterone supplementation - Weekly injections of 17  $\alpha$  hydroxy progesterone caproate 500 mg IM*
  - *Patient is asked to avoid sexual intercourse*
- *Removal of stitch:*
  - *The stitch should be removed at 37th week, or earlier if labor pain starts or features of abortion appear.*
  - *If the stitch is not cut in time, uterine rupture or cervical tear may occur.*

- **Complications:**
  - Slipping or cutting through the suture
  - Chorioamnionitis
  - Rupture of the membranes
  - Cervical scarring and dystocia requiring cesarean delivery.

## Prognosis of recurrent miscarriage

- The overall risk of recurrent miscarriage is about 25–30% irrespective of the number of previous spontaneous miscarriage.
- The overall prognosis is good even without therapy.
- The chance of successful pregnancy is about 70–80% with an effective therapy.